Overview of Industrial Distributed Generation (DG) Projects

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DOE Distributed Power and Industrial Generation Program/Peer Review

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OAK RIDGE NATIONAL LABORATORY
ENERGY EFFICIENCY AND RENEWABLE ENERGY PROGRAM
U. S. DEPARTMENT OF ENERGY

Program Mission

The Industrial DG Program:

- **Conduct RD&D on High-Value Commercial and Industry DER Applications**
- **Demonstrate DER Benefits In The Market Place**

Program Objectives

- Facilitate DER Acceptance in End-use Sectors
- Develop Decision / Design Tools and Conduct Feasibility Studies
- Demonstrate / Quantify Value to End-Use Customers
  - High Efficiency
  - Reliability
  - CHP, etc.
  - Equipment Issues and Cost Effectiveness
- Document Case Studies for Education / Outreach

Relationship to DOE OPT DER Program

- **Program Supports Key Administration and Agency Initiatives**
  - **CHP – National Energy Policy (NEP)**
  - **Peak Load Reduction**
  - **Increased End-Use Efficiency (G, T, & D)**
  - **Reliability and Energy Security**
- **Facilitates System-Level Integration of Technologies**

Program Background

- Funded Under Interior Appropriations As Part of "DER End Use Systems Integration and Interface" Element
- Program Began in FY'99 in DOE / OIT by Addressing Highly Varying Industrial Loads for the Steel Industry
- Now Part of the New DOE / OPT / DER Program Addressing DER for Industrial End Use Applications
- Completed Competitive Solicitation for New Projects in FY'00
  - 8 Contracts Awarded End of '00 and Beginning of '01
  - 9 Industrial DG Projects in Total
- Roughly $3M Total Project Funding Over 3 Years With Industry Providing a 40% Overall Cost-share

Project Participants

- **NISource (1999)**
  - Purdue
  - Colorado School of Mines
- **Gas Technology Institute (GTI)**
  - University of Illinois at Chicago
  - Ballard Engineering
- **Industrial Center, Inc.**
  - CSGI Inc.
  - Resource Dynamics Corp.
  - CDH Energy Corp.
  - Exergy Partners Corp.
  - Energy Nexus Group
- **NYSERDA**
  - Pace Energy Project
  - Energy Nexus Group
- **Energy Nexus Group**
  - Primen
  - NYSERDA, Industrial Center
- **Salt River Project**
  - Intel
  - Sematech
  - Center for Energy and Climate Solutions
- **Southern California Gas (2)**
  - Dana Technologies
  - Paramount Petroleum Corp.
  - US Marine Corps Air Ground Combat Center
  - Naval Facilities Engineering Command
  - Solar Turbines
- **Syska Hennessy**
  - Verizon
  - International Fuel Cells
  - Tishman
  - Keyspan

Industrial DG Applications

- **Industries:**
  - Steel Arc Furnaces and Rolling Mills – NISource
  - Semiconductor FAB Plants – Salt River Project
  - Telecommunications CO – Syska & Hennessy
  - Food Processing & Metal Plating – Industrial Center
  - Fuel Refining Plant – Southern CA Gas Co.
  - Federal Industrial DG – Southern CA Gas Co.
- **DER CHP Market Issues (Siting, Potential, Benefits):**
  - City of Chicago – GTI
  - State of New York – NYSERDA
  - Nationwide – Energy Nexus Group
- **Tools**
  - Reliability & Availability Database – Energy Nexus Group
  - GIS for Fuel Supply and Grid – NYSERDA

Future Opportunities

- **Additional End-Use Sectors Request Support**
  - **High Tech Industry**
  - **Airports (transportation)**
  - **Merchant Industry**
  - **Other Light Industrials**
- **New Solicitation for High-Tech DER Applications**
  - **A Number of Proposals Received From Industry**
  - **DOE Funding With Industry Cost Sharing**
  - **Multiple-year Projects**
- **Evaluating Other End Use Sectors**

High-Tech DER Projects

- **RFP — DER in the Data Processing and Telecommunications Industries**
  - **Released July ‘01**
  - **Awards to be Announced in February ‘02**
- **Purpose: Encourage expanded DER use in energy-intensive, high-tech data industries**
  - **Electronic data/signal processing cornerstone of US**
  - **Very energy intensive (e.g. 50 to ?100 watts/sq ft)**
  - **Need high reliability (e.g. 99.9999%) and PQ**
  - **Interruption Costs can vary from $1000s to $100,000s depending on process and time of event & duration**
  - **Large cooling loads for electronics (CHP potential)**

High Tech DER Projects (cont.)

- **Type of Projects**
  - **High-Tech DER Implementation Projects**
  - **Assessments of Existing/Proposed Installations**
  - **Improved Project Design Tools**
  - **Development of Innovative Methods to Integrate DER**
- **Desired Applications**
  - **Telecommunication Centers (e.g. switching centers)**
  - **Commercial Data Processing Centers (e.g. bank card processing centers, airline reservation systems)**
  - **Internet and Large Corporate Computer Service Centers**

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